

KT8

menTCS Remote I/O Extension for 8 Cards

SIL 4 Modular Train Control System I/O Box for Safety in Transportation

- » *SIL 4 modular Train Control System menTCS*
- » *Safe I/O boards (currently in certification process)*
- » *Certification packages available*
- » *Distributed safe I/O and controller boxes connected via real-time Ethernet*
- » *Support for QNX safe operating system*
- » *Compact 40 HP housing for remote locations*
- » *Full EN 50155 compliance*
- » *Rack-mounted or wall-mounted*



Safe Remote I/O for Train Control Systems

KT8 is a safe, remote I/O box inside the modular Train Control System menTCS. The modular system platform menTCS is usable for safety-critical train applications like train control, automatic train operation (ATO) and automatic train protection (ATP) up to SIL 4.

Modular, Built-to-Order I/O Configuration

Based on modular 19" technology, KT8 provides eight slots for safe I/O cards, which can be configured as built-to-order (BTO) options. menTCS I/O cards support the common I/O requirements requested in trains. The KT series of systems provides scalable sizes of eight slots, six slots and four slots.

Part of the menTCS Train Control System

menTCS is a modular SIL 4 certifiable family of CompactPCI-based standard products usable for every kind of safety-critical railway application - from a single function to the main control system of the train. It can be configured to control anything in the train that requires functional safety - under SIL 4, SIL 3 or SIL 2 requirements. menTCS communicates via standard EtherCAT real-time Ethernet and interfaces to any type of consist fieldbus network like MVB, CANopen, Profinet etc. This makes it easy to integrate into a TCN network as well as into regionally different Train Control Systems like ETCS, CTCS, ATCS or Klub-U. The high level of flexibility of menTCS results in significant cost and time savings during computerization of the train.

Compact and Cost-Saving Remote I/O

Being modular and SIL 4 certifiable, the KT series reduces the certification risk and efforts. This makes both your system costs and project schedule predictable. All KT systems have a dedicated EtherCAT component, the I/O head, for interconnection of the boxes and power supply. This in turn reduces cabling. I/O functions can still be located close to the remote actors and sensors, with fast data transmission within the menTCS. The compact format with a maximum width of 40 HP and a reduced depth compared to standard 3U systems allows installation even where space is very restricted, simplifying retrofitting of older trains.

Certification and Standards Compliance Included

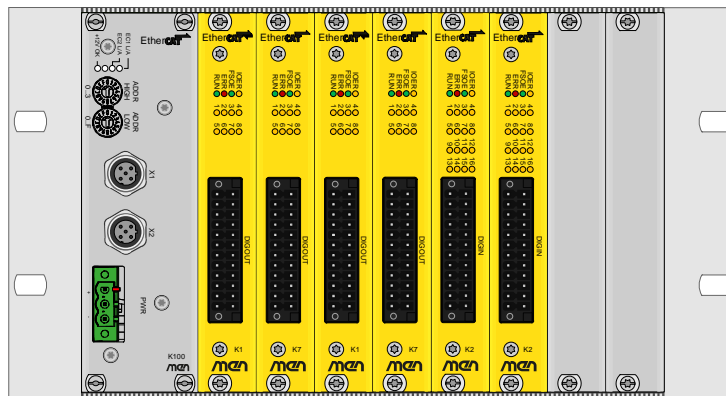
Safety-related menTCS components come with certification packages and complete support for the safe operating system QNX, including safe protocols, I/O framework etc.

All menTCS components that are safety-relevant are developed according to EN 50128 and EN 50129 standards and comply with all environmental requirements of EN 50155 for rolling stock: temperature class TX, shock, vibration, humidity, dust, isolation, PSU hold-up times, EMC regulations etc.

Mounting and Cooling Options

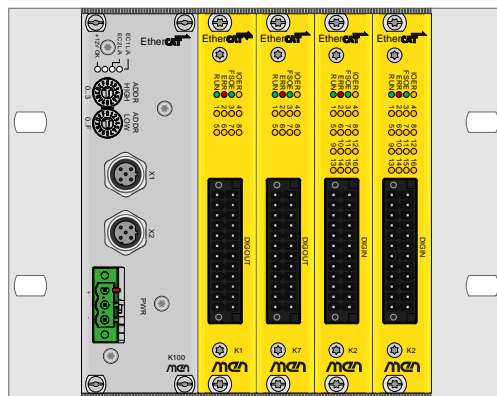
The system can be wall or rack-mounted, also on a DIN rail, and is air cooled.

menTCS Remote I/O Boxes KT8 and KT4



KT8, Configuration Example

- 2 x 8 digital outputs, SIL 4, through K1/K7 combination: high-side and low-side switching
- 16 digital inputs, SIL 4, through 2 x K2



KT4, Configuration Example

- 8 digital outputs, SIL 4, through K1/K7 combination: high-side and low-side switching
- 16 digital inputs, SIL 4, through 2 x K2

Note:

A KT6 system with six configurable I/O board slots is available on request.

menTCS System Controller in Combination with Remote I/O Boxes

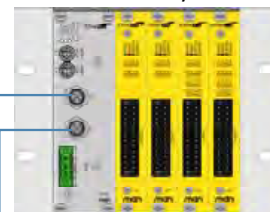
MH50C menTCS Controller



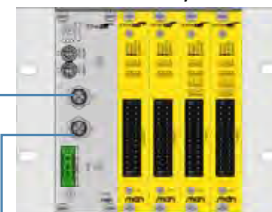
KT8 menTCS Remote I/O



KT4 menTCS Remote I/O



KT4 menTCS Remote I/O



Front Interfaces

- Ethernet
 - Two 4-pin M12 connectors, D-coded, 100BASE-T
 - Four link and activity LEDs (two per channel)
- menTCS system control
 - Two hex switches to configure chassis ID
- Power supply
 - One power inlet connector
 - One voltage status LED
- Safe I/O
 - As configured using plug-in boards

Safe I/O

- menTCS I/O Board
- Configurable: yes
- Possible in slots: 1, 2, 3, 4, 5, 6, 7, 8
- Possible Configurations
 - 8 digital outputs, high-side switching, SIL 2 (SIL 4), -40° to +85°C, conformal coating
 - 8 digital outputs, low-side switching, SIL 2 (SIL 4), -40° to +85°C, conformal coating
 - 16 digital inputs, SIL 2 (SIL 4), -40° to +85°C, conformal coating

Supervision and Control

- Output voltage supervision and thermal supervision

Electrical Specifications

- Supply voltage
 - 24 V, 36 V, 48 V, 72 V, 96 V, 110 V DC nominal; 14.4 to 154 V max. (EN 50155)
 - Power interruption class S2 (10 ms) (EN 50155)
- Power consumption
 - 16 W approx. (with 8x K1)
 - 58 W max.

Mechanical Specifications

- Dimensions
 - (W) 210 mm, (D) 133 mm, (H) 133 mm without brackets and connectors
- Mounting Possibilities
 - Wall-mount, or
 - Rack-mount in 19" cabinet, or
 - DIN-rail mounting
 - Two systems side-by-side to build a single 19" chassis
- Weight
 - 1450 g (barebone configuration)

Environmental Specifications

- Classification for railway applications
 - EN 50155: Rolling stock, vehicle body
 - EN 50125-3: Wayside, at least 3 m off the track inside a switch box, low temp. class T2, high temp. class TX
- Temperature range (operation):
 - -40°C to +70°C with up to +85°C for 10 minutes (EN 50155, class TX; EN 50125-3, low temp. class T2, high temp. class TX)
- Temperature range (storage): -40°C to +85°C
- Cooling concept
 - Air-cooled, airflow 0.5 m/s
- Humidity
 - EN 50155: Rolling stock, vehicle body
 - EN 50125-3: Wayside, at least 3 m off the track inside a switch box
- Vibration/Shock
 - EN 50155: Rolling stock, vehicle body class B
 - EN 50125-3: Wayside, at least 3 m off the track inside a switch box
- Altitude: -300 m to +3000 m
- Protection rating
 - IP20 (IEC 60529)

Safety

- Functional Safety
 - Certifiable to SIL 1, SIL 2, SIL 3 or SIL 4 according to EN 50129, depending on I/O board configuration
- Electrical Safety
 - EN 60950-1: Class I equipment
- Fire Protection
 - EN 45545-2, hazard level HL3

EMC

- EN 50155: Rolling stock, vehicle body
- EN 50121-4: Wayside at least 3 m off the track (with external protection elements)

Software Support

- PACY (Process Data Framework for Cyclic Applications)
- QNX

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www.men.de/products/kt8/

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